

Collamat® 9110i

User manual

Chapter 1: Security

- Reading the User Manual and in particular this chapter on the safety instructions must be read, understood and strictly observed before the C9110i is put into operation.
- Location of the User Manual must be permanently available at the C9100i operating site.
- It must be ensured that the local supply connections (voltage, frequency, etc.) comply with the installation data. Connection of the electrical supply must be carried out by a licensed electrical technician, and must also comply with the local regulations, in particular those relating to protective measures.
- The monitor C9110i is exclusively intended to control the labeller C9100i.
- The installation of the labeller C9110i must be done by a trained specialist considering the national specific regulations of prevention of accidents, construction of electrical and mechanical systems and noise suppression (RMI)

General Safety Instructions

- The C9100i must only be operated, serviced and maintained by persons who are familiar with the User Manual in force concerning work safety and accident prevention.
- The C9100i must only be operated by trained personnel who have been instructed in its use.
- It must also be ensured that only authorized personnel are allowed to work with the C9100i.
- Work with the C9100i which is not covered by the User Manual must be carried out only by Collamat Stralfors AG technical personnel or by staff trained by Collamat Stralfors AG.
- It is necessary to read this manual, Operating Instructions C9100 monitor and traction unit, to operate the C9100i.

Operator requirements

- The operator must be familiar with the relevant operating and display units.
- The operator must understand the effects of an operating function on the system as a whole.
- The operation of the control and display elements as well as the alarm and monitoring system must be tested before using the module/control system.
- Indicator and monitoring devices must be constantly checked for the occurrence of transient operating conditions and limiting values, and for warning and alarm messages.
- The operating procedures for emergencies (e.g. emergency switch-off in case of fire) must be tested regularly.

Operating

Disassembly and repair (Service and Maintenance)

- Before operating the system care must be taken that any loose items are removed from rotating parts of the system, nobody is present in the danger area around moving parts of the system, all repair work has been completed all protective equipment is in place and in working order.
- Disassembly and repair work must be carried out by trained specialist staff with the aid of the relevant disassembly and repair instructions.
- In the case of damage or faults which cannot be rectified by the user, the customer service or its representatives must be informed.
- The continuous operational readiness and reliability of the control and monitoring electronic systems depends vitally on strict observance of the maintenance instructions plan and carrying out the maintenance and repair work precisely.
- Before disconnecting parts of the control and monitoring electronics, the person responsible (shift leader) is to be informed that the corresponding parts of the system are out of action
- Before carrying out work on parts of the control system which carry voltage, power must be disconnected from the appropriate areas.
- Only original manufacturer's spare parts are to be used to replace defective modules. The use of non-original spare parts will exclude all liability on the part of the manufacturer.
- Use only the cleaning materials explicitly indicated or recommended by the manufacturer.
- After removal, defective electronic components and units must be stored correctly, i.e. protected in particular against damp. For transport, parts are to be provided with shock-proof packing.

Important warnings

- Take notice of the technical data of the C9100i. Especially the environment conditions must be observed.
- Install the C9100i at a dry location, protected from splashing water.
- Operate the C9100i only by trained personnel.
- In case of non-authorized modifications the guarantee will become void.
- Before connecting non-standard products, ask your competent technical supporter.
- Peripherals to the C9100i must only be connected to the mains socket of the monitor. These devices must be approved by Collamat Stralfors AG. The specifications of the mains socket are specified in the Technical Appendix.
- The safety symbols and the danger advice on the C9100i and in this manual must strictly be observed.

- The C9100i must only be set up in switched off condition. Before connecting or disconnecting the labeller C9100i to or from the monitor switch off the monitor. Monitor and distribution box are only allowed to be opened by authorized personnel.
- Danger of pinching hair, jewellery, ties, clothes etc. into the traction unit!
- Danger of injury by cutting fingers in the paper web zone!
- Danger of injury in the dancer roller zone of the C9100i rewinder and unwinder!
- Danger of injury in the case of non-expert use of the C9100i in the paper stock control zone.

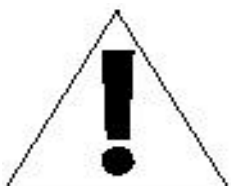
Residual dangers are sources of danger inherent in the design of the machine which cannot be eliminated by means of design measures or protective equipment. The C9100i is constructed in accordance with currently accepted technology and the recognised rules concerning work safety. Nevertheless, the following residual dangers may affect the user in the course of work:

- Touching the exposed pins of the mains plug can cause electric shocks.
- Don't be close to the label web when system is running. The label web can be as sharp as a knife.

Residual danger

Symbol description

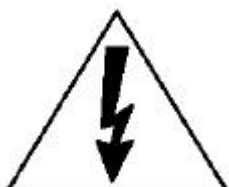
ATTENTION



Indicates danger of damaging the Collamat ® 8600/9100 or other system components, with a potential consequential danger of injuries.

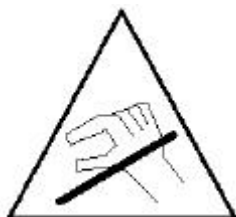
DANGER

Indicates an immediate hazard for persons.



DANGER

Shock hazard due to high voltage at component.

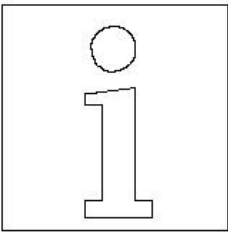


DANGER

Hazard due to high temperature component.

**ATTENTION**

ESD warning (ElectroStatic Discharge). The PC boards or components may only be touched in an electrostatically protected environment.

**NOTE**

Important or additional information to C9100i or to the documentation.

Protection action

In case of emergency press emergency button to stop the system. Before using system be sure that you know where the emergency button is.

Chapter 2: Use of this manual

Congratulations to the purchase of the Collamat High Speed System C9110i.

The intended target group for the manual is the personal involved in the daily operations, i.e. the **“normal users”** and also the personal who is in charge for fine tuning the whole system (dispensing optimization) in case of using a new label, i.e. the **“super users”**. New label means new values for one of the relevant label-parameters which are size, shape, material and release. Once one of this relevant parameters will change, the dispensing optimisation has to be executed. The super user has to be trained accordingly.

User groups

Related sources of information:

- Operating Instructions C9100 Monitor
- Operating Instructions C9100 Traction Unit
- Technical Handbook C9100

Related Information

Chapter 1 - Security	Very important to read before putting C9100i in use, to avoid accidents and damages.
Chapter 2 - About this manual	A short explanation for whom this manual is written and a the basic concept behind each chapter.
Chapter 3 - Introduction to C9100i	General information about the C9100i its concept, advantages and application areas. The standard components which C9100i consists of are briefly illustrated but for deeper understanding please see chapter 4 and 5.
Chapter 4 -Labeller	An explanation of its parts such as the unwinder, traction unit, adapter, rewinder and monitor. This chapter also reveals how you should thread the labeller and do adjustments on the labeller but here you also find the entire menu tree of the monitor.
Chapter 5 - Super Control MCS§	The chapter about the Super Controller clarifies its parts and demonstrates its structure.
Chapter 6 - Operating Instruction	The operating instructions are classified in the groups normal operating, initialisation and optimisation. The normal operating and the initialisation is done by operator and optimisation by the super user. This chapter also guides you through the necessary steps.
Chapter 7 - Technical Data	In this chapter the error handling of the labeller is simplified and gives direction were other technical data is to be found.

Chapter 3: Introduction to C9110i

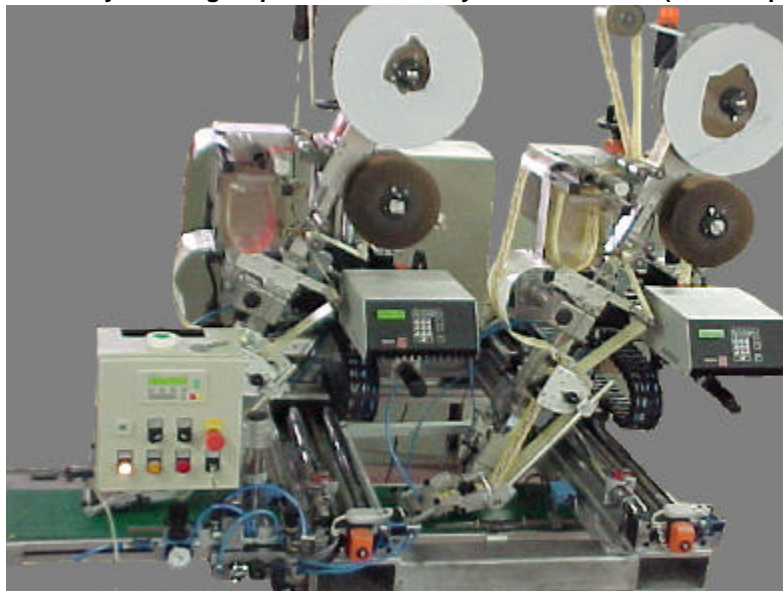
C9110i is not only a very **fast dispensing system**, it is also a **non stop system**. C9110i can dispense labels on goods with a speed of up to 200m/min with an accuracy of ± 1.5 mm. Goods have to be endless and flat (Paperweb,...) and the sizes of the labels have to be inside a specified range (length: from 20 to 95 mm; width: from 30 to 95 mm). The dispensing of a new label has first to be optimized by means of a well defined procedure, the **dispensing optimisation** for a label. This optimisation mainly consist in the choice and adjustment of an Adapter, but also in setting some parameters on a super controller and on the dispensing controller (C91 Monitor). The optimisation procedure takes in consideration the relevant label-parameters (size, shape, material, release) and also of relevant labelling-parameters (maximum goods-speed, maximum dispensing-speed, label-placement on the goods, placement for goods-sensor and dispensing-head).

General

Please find in chapter operating instruction in this manual the detailed description of the dispensing optimisation.

Once this optimisation procedure is done, all necessary parameters and set point values have to be assigned to this new label and saved (assign a parameter-set to a type of label). Further the **normal user** or **operator** has just to call back the assigned parameters and to adjust the adapter; that is the procedure of the **dispensing initialisation**. During the **labelling operation** (after optimisation and initialisation) the user or operator has just to feed the dispenser with label rolls (consumable) and to take off the backingpaper (waste).

Assembly of a high speed standard system "C9110i" (non-stop).



The system is built up on two Collamat C9110 both mounted on one frame. The whole system could easily be integrated in a production line and mounted just over the paperweb (goods) on one underframe. For the optimal placement of the label on the goods, each Collamat could be moved in 3 directions; one vertical, and two horizontal respectively as inline and transversal to the paperweb direction

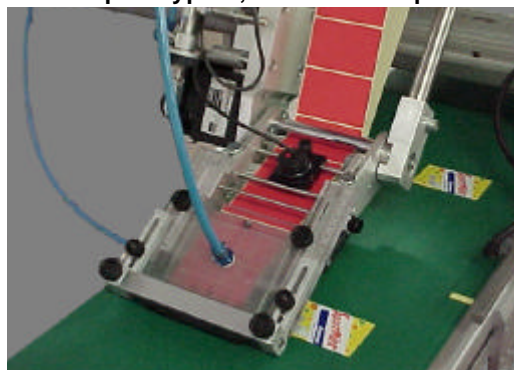
Concept

The dispensing system works in two ranges, a normal- and a high-speed range.

In the **normal range** the dispensing speed is synchronised with the goods speed; at the moment of the impact between label and goods and during the whole application process, both speeds (goods and label) have exactly the same value; which corresponds to the normal Collamat dispensing method.

In the **high speed range** the dispensing speed is always lower than the goods speed and the Collamat act as a delayed system in time. The result does correspond to a shift backward of the label position; the length of this backward shift will increase linearly according the difference between dispensing speed and goods speed. This maximum delay length does correspond to the fastest defined goods speed and could be easily measured on the paper. This delay length is the most important input parameter to a dedicated super controller. The super controller take care of this delay and control the two Collamats by means of an advanced time controlled GSC2-signal. A part from the super controller we also need a special adapter which allows an optimal procedure of the label application. Once the label has the right speed, the front label edge will be pressed between the press-roll and the paperweb; at this moment the label will be torn away with the goods and the contact area between label (end of label) and backing paper must be set to a minimum. The distance between axis of press-roll and dispensing edge has to be adjusted in accordance to the label length. Our adapters have all necessities features so the super user or the normal user can do these adjustments to a very easy way. Two adapters cover the whole label ranges; adapter type 1 for short label length (from 18mm to 40mm), and adapter type 2 for long label length (from 35mm to 95mm). Both adapters have a press-roll which is fixed on the usual adapter; the long adapter is equipped with an additional vacuum plate for driving longer labels.

Adapter type 2, with vacuumplate



- Increasing production flow with remained accuracy
- Based on known technologies
- Easy optimisation according to size, shape and material of labels
- Non-stop operating
- Adapted for inline finishing-line (target market).

Advantages

actually the labelling-system is very often the slowest aggregate in an inline-finishing plant and therefore is slowing down the whole line. Labelling speed up to 200 meter/minute does correspond actually to a standard overall line-speed.

- Downsize the production costs (faster throughout)
- Faster return of invest

- manufacturing- & processing- paperindustrie,
 - direct mailing
 - advertising
 - marketing
- high production-capabilities for
 - down sizing the cost
 - increasing return of invest
- adjustment of the labelling-throughout

Application areas

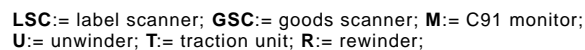
The high speed is built on two standard C9110i Collamat in a Non-Stop configuration. It includes the usual components as traction unit, mechanical unwinder, rewinder and module rail. New components are the air sling with electrical drive for label web (placed between unwinder and traction unit) and the adapter. All these components are fixed to the corresponding module rail.

Structure

The mechanical parts of a dispensing system are fixed on a vertical double columns with horizontal & vertical adjustments units (handwheels). All these parts build up the mechanical dispensing part of one Collamat. One monitor is also fixed to the corresponding vertical double columns with a dedicated bracket-set. Mechanical dispensing part and the monitor build up one complete dispensing system. Each dispensing system is mounted on a horizontal adjustment unit (double steel tube) which is electrically driven. This does allow the displacement of each dispensing system over the whole width of the Paperweb. Each horizontal adjustment unit is fixed on the legs of the frame. On this frame are also fixed an operating box, a control box with a pressured air system fixed on it, encoder-wheel for paperweb speed and goods scanners (mark readers). The mainframe with all parts could easily be placed and fixed on a rack (see also installation).

The control box (fit at the rear of the C9110i) contains the main connection, transformer, control relays, fuse, PLC, MCS-IO, opto-couplers and connection clamps. On a side wall of the box is fitted the electrical power switch and the pneumatic or compressed air set. This set is composed of one manual main valve, one maintenance unit (air conditioner) with pressure input regulator, and two switch/regulator set for both dispenser.

. Blockdiagram of the relevant components



fixed on a vertical guide bar for optimizing the distance between sensor and mark (mark placed on the paperweb-formular or goods). This sensor (with the vertical guidebar) can be slid and fixed on an horizontal guidebar in direction of the paperweb. The horizontal guidebar can him be slid and fixed along an horizontal profil rail which is fixed at a leg of the mainframe (perpendicular to the direction of the paperweb-motion. Each marksensor-system comprises the sensor, two guidebars (vertical & horizontal) and a profil rail fixed at the corresponding mainframe leg. All fixing mechanism are done with screws. This positioning system allows to place the mark reader (or mark sensor) over the wall paperweb width and also over the right place in paperweb direction.

The contact line between adapter roll and paperweb does correspond to the impact line of the labelling process; this line has to be placed just over the axe of a back pressure roll. The label will be taken in sandwich there and the dispensing is done under stable conditions. The placement of the adapter in paperweb direction is done with the horizontal adjustment part of the double column (driven by handwheel). The placement of the adapter in direction of the paperweb width is electrically driven (two steel tube with a traction spindle placed on each mainframe leg for guiding and traction of the corresponding double column). The vertical position of the adapter is done with the vertical adjustment of the double column (driven by handwheel).

The encoder delivers the pulses as a frequency directly proportional to the paperweb speed. It is composed of a friction wheel which is driven by the paperweb. The impact points between friction wheel and paperweb does correspond to a short friction segment equal to the thickness of this wheel. This friction segment is parallel to the adapter roll and needs also a back pressure under the paperweb. For this reason this friction segment will be placed over the back pressure roll of the master collamat (axe over axe). The encoder can be positioned over the whole paperweb area of concern in the same manner as the mark reader. This encoder positioning system comprises a vertical guidebar for the sensor with sliding and fixing possibilities, the mark reader, a cross profil rail between the mainframe legs for sliding and fixing the vertical guide bar; the cross profil rail can be slid in direction of paperweb width and fixed on two other profil rails fixed each on the inside wall of the corresponding mainframe legs.

The whole structure offers a great flexibility while installing or optimising the labelling process.

Standard components

Standard components list

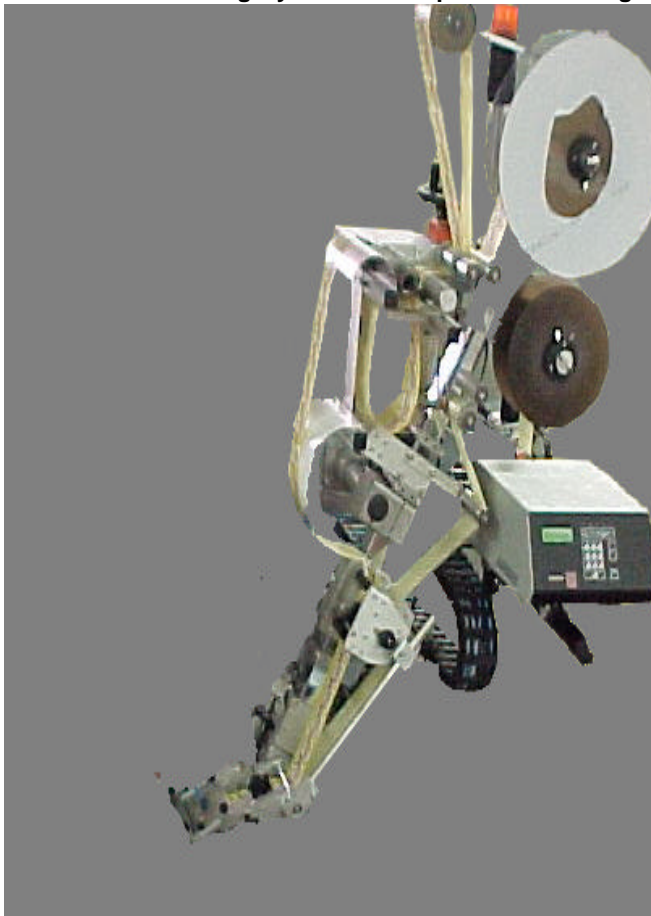
Designation	Function	High-speed specific
2 * <u>dispensing system</u> consisting each of:		
- mechanical part consisting of		
- Unwinder (midi)		no
- air sling	smother feeding of labelweb	yes
- traction unit		no
- adapter_1 & adapter_2 (short & long labels)	guiding & pressing the labels according high-speed rules	yes
- rewinder		no
- module rail		no
- vertical double columns with h. & v. adjust.		no
- monitor		
1* <u>super-controller</u> consisting of:	compensation for dispensing time delay	yes
- MCS-IO		
- MCS-T		
1*<u>electric-pack</u> consisting of	controlling high-speed & Non-stop procedures	yes
- operating-box		
- control-box containing:		
- Trafo, fuse, relays, PLC, connection-clamps, main-switch and MCS-IO		
- 2*set of indication-lamps		
1*<u>air pressure pack</u> consisting of:		yes
- air conditioner, pressure-regulator, injector (vacuum), valves,		
1*<u>sensor pack</u> consisting of:		yes
- 2*GSC-scanner (mark-reader) with brackets	fixing-/adjustment possibilities	
- 1* encoder (1000 Imp./220mm revolution) with brackets	fixing-/adjustment possibilities,; high resolution for super controller	yes
1*frame consisting of:	special design	yes

Designation	Function	High-speed specific
- two legs tube system with lateral consolidation	could be transported by stackers	
- 2* horizontal double columns with electrical driven adjustment for mounted dispensing system; each column fixed on the respective frame-leg.		
- frame mounting set: 4*fixing angle with guiding cones to be fixed on the underframe	4fixing angle with guiding holes	

Chapter 4: Labeller

The overall goal is that our customer can dispense labels as accurate and fast as possible. The handling of the labels is done through the labeller. The knowledge of its parts and how those can be adjusted will contribute to a smoother workflow and better labelling results.

Standard labelling-system with optional air sling.



The purpose of the unwinder is to continuously provide labels without interference. The unwinder unit consists of a midi unwinder and an label-airslings with a motor for a first traction level of the labelweb. When the labelweb is moving the dancing arm is to get pulled down and causes the winder to release its brake and cases to feed more paper. When no more paper is needed, the dancing arm shall be adjusted so that it turns back to its original position by itself. This adjustment is done by setting a torsionspring of the unwinder. The dancer roller represents a paper buffer to quickly supply or take up the label web. Due to

Unwinder

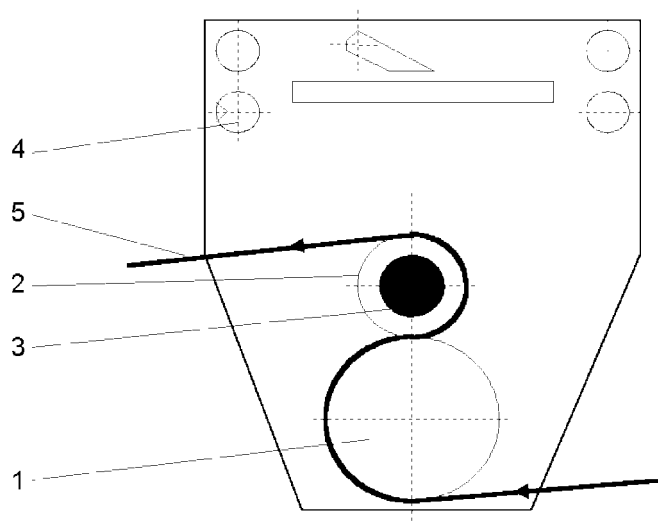
the adjustable spring force the feeding of labelweb could be optimized in function of the demand (minimum of hits and tension on the labelweb). The spring force is set by turning a knurled knob in the according position.

A variable portion of labelweb hangs up on two horizontal axes and builds up an vertical falling down labelweb-airsling due to the gravitation. On labelweb demand, the deepest point of the airsling rise up and the length of the sling becomes shorter. This deepest point will be detected at two fixed levels (high and low) by two sensors. This two sensors will respectively switch on and off the traction motor of the airsling. The airsling acts as a two points regulator; the airsling is able to feed continuously on a soft manner (no hits and variation of tension on the web) the demanded labelweb from the following dispensingsystem.

Traction unit

The purpose of the traction unit is to keep the paper web steady and tight before dispensing and after dispensing having the paper in a pull state, which causes the entire paper web to move and is the actual feed of the labels.

Traction unit



- 1 Traction roll
- 2 Back pressure roll
- 3 Knurled knob
- 4 Deflection shaft
- 5 Backing paper web

Turn the knurled knob by 90° in order to ease the back pressure roll at the traction roll. For right hand version turn clockwise otherwise counterclockwise. Position the back pressure roll in the middle of the backing paper. In order to do this the set screw needs to be release. If the back pressure roll not is under tension an error message will appear: "paper traction / -end". The paper brake has to be fix and hold the label web steady. Before labelling the entire label web must be stretched to avoid label errors.

The traction unit as well as the other peripherals are mounted on a module rail. All parts are surfaced treated to protect from corrosion. The special coating of the traction roller affords permanent torque transmission to the paper web without slip. The force of the paper web brake is adjustable. The traction roller can be easily turned by hand during Power off for easily threading and installing the paper web.

The purpose of the adapter is to dispense the label on its product. There are two adapters, one for the labels with a length under 30 mm and one between 40 and 95mm. The no mans land between 30 and 40 mm depends on the label stiffness, form, adhesive and for the optimal solution we recommend the super user to test both.

Adapter

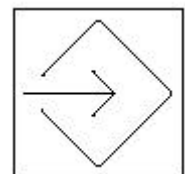
The purpose of the rewinder is to collect the baking paper and make it easy to remove for the user. If the C9100i is switched on without having fixed the backing paper, or if the backing paper is torn apart during the application, the dancer will shot up to maximum speed position but will stop after 8 rotations. It can be restarted when the dancer is at stop speed position and a reset of the stop command.

Rewinder

The power supply and the electronic control are built into a metal casing. All peripherals are connected to a connector box connected to the monitor back panel by one single D-sub-connector. A large heat sink allows to operate the monitor without additional fan. The monitor can be mounted in various positions. The monitor contains the following assemblies:

Monitor

- Noise filter with voltage selector. The noise filter keeps EMI outside to prevent any interference with the electronic control and also prevents EMI to be transmitted to the mains supply. The voltage selector allows versatile adaption of the power supply to different main voltages.
- Transformer which supplies the power for the labeller, unwinder, rewinder and monitor.
- Interface p.c. board which connects the motor drive to the power supply and to the controller. The electronic part of the power supply is also installed on the interface p.c.board which shapes all input and output signals to and from the controller.
- Controller p.c.board comprises a Hitachi H8/5332 microcontroller, EPROM with a software, LC-display and short -stroke keyboard and the nonvolatile memory. The LC-dis-

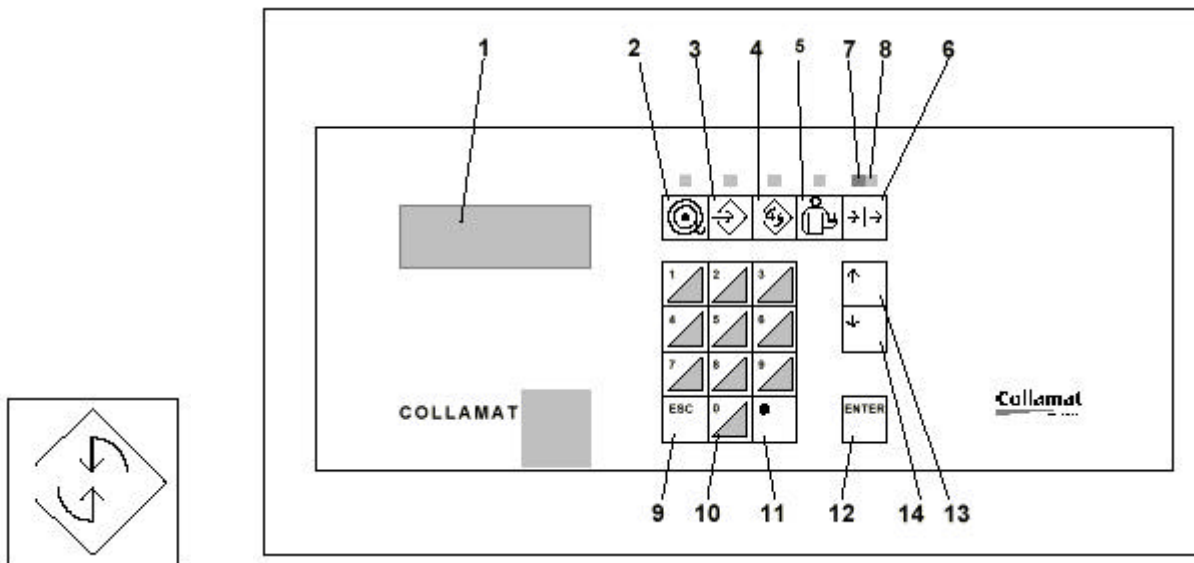


play has four lines with 20 characters each and a background illumination. The controller p.c.board communise from panel and controller in one component.

All settings are done via keyboard.

Panel

monitor panel



Legend

- | | |
|---------------------------|--------------------|
| 1. 4 line LCD | 8. RUN LED |
| 2. Labeling mode key | 9. ESC key |
| 3. Programming key | 10. Keyboard 0...9 |
| 4. Configuration key | 11. dot Key |
| 5. Service indication key | 12. ENTER key |
| 6. RUN/STOP key | 13. UP key |
| 7. STOP LED | 14. DOWN key |

Actions

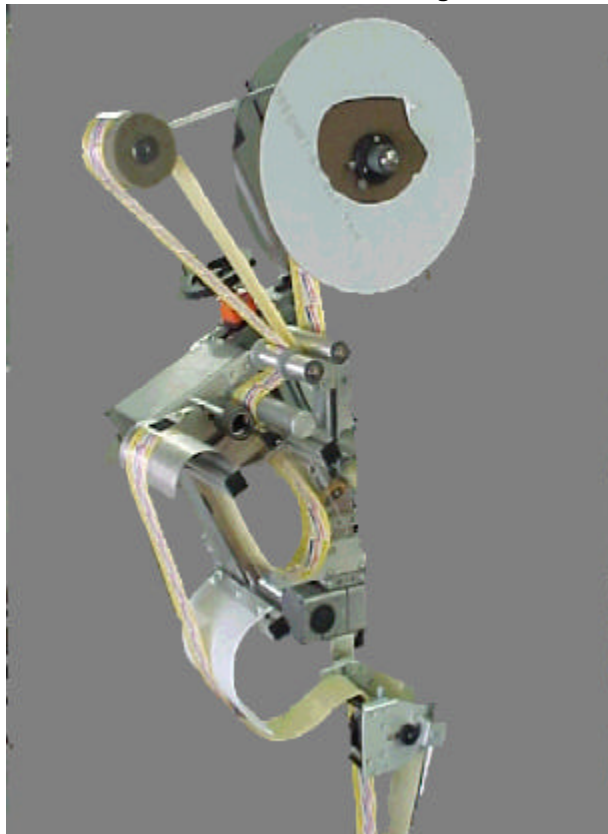
The actions here mentioned are adjustments needed to optimise the system. Daily chores such as threading the labeller will also be mentioned here.

Thread of label

The paper web will be pulled from the unwinder over the dancer, in between the two rollers before the air sling, into the paper loop and from there to the traction unit. Conduct the paper web under the paper break and pull it to the dispensing edge. Pull out the paper web

approximately 1 meter to make the threading through the traction unit easier. Thread the paper under the traction roller, between the traction roller and the back pressure roller and then over the back pressure roller. Pull out the clamp strap on the rewinder. Pull the backing paper over the dancer to the rewinder core and fix the clamp strap again. Please make sure that the entire paper web is stretched

Unwinder with air sling.



Compress the two handles on the holding disc and pull it out of the unwinder core.

Take off disc

Take off the disc and the old label roller. Put on the new one, thread the unit and put back the holding disc.

Change label roll

Due to dancing arm type and mounting position the force needs to be adjusted. This force can be adjusted with a spring force. After you have dismantled the housing around, a knob with a lot of holes in it can be seen. The force spring is stuck in one of the holes. When the knob is pressed in, turned and left in a new position, the force is changed. If the force

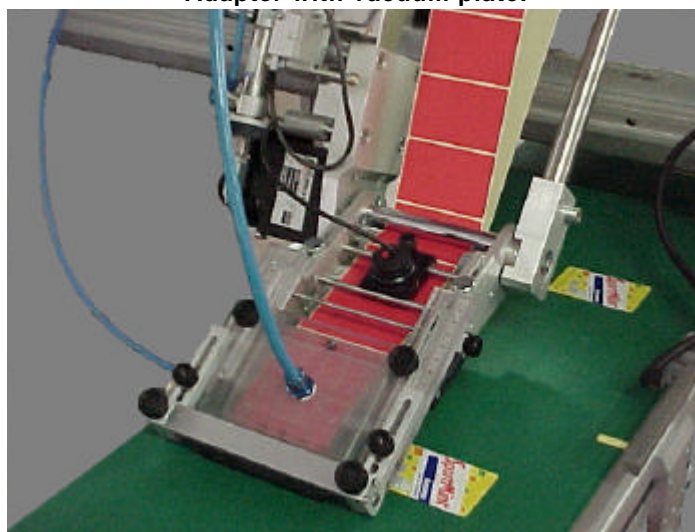
Adjust spring force of Unwinder

spring is pressed harder, the dancing arm moves more easily to its original position but it takes more force to move the dancing arm down to get more paper.

Adjust the adapter

The required spring force can be adjusted with the cylinder head screw on the flap adapter. The force gets softer when the screw is turned clockwise. The slope of the flap adapter can be changed. To release the knob two turns is needed. Extend the screen by hand, position the adapter in required position and fix the knob again.

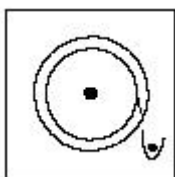
Adapter with vacuum plate.



Adjust the press roll

Depending on your labels and your goods, you want to adjust the press roller.

Change in the monitor



Menu Tree	Userlevel	Run/Stop mode
Labelling Mode		
--Label jog	Operator	Stop
--Select program	Operator	Stop
--Information display	Operator	Run
--Reset counter	Operator	Stop
--Preset counter	Operator	Stop
--Select counter	Operator	Run

Menu Tree	Userlevel	Run/Stop mode
--Reset nonstop	-----	-----
Programming		
--Change program	Super User	Stop
----Label scanner sensitivity	Super User	Stop
----Label length	Super User	Stop
----Label suppression	Super User	Stop
----Presdispensing	Super User	Stop
----Position	Super User	Stop
----Speed	Super User	Stop
----Maximum speed	Super User	Stop
----goods suppression	Super User	Stop
----Labelling mode	Super User	Stop
--Profiling	-----	-----
--Program name	Super User	Stop
--Program preset	-----	-----
Configuration		
--User menu	Super User	Stop
--Language	Super User	Stop
--User level	Super User	Stop
--Error handling	Super User	Stop
--Nonstopmode	-----	-----
--Adaptermagnet	-----	-----
--Motor direction	Super User	Stop
--Polarity ifeed	-----	-----
Service functions		
--Software-version	-----	-----
--Error sequence	-----	-----
--Self-test	-----	-----
--Remote control	-----	-----

Menu Tree	Userlevel	Run/Stop mode
--Working time	-----	-----
--Motor running	-----	-----
RUN/STOP	Operator	Select

See also

- Operating instructions C9100 Traction unit
- Operating instructions C9100 Monitor
- Technical handbook C9100

Chapter 5: Super Controller MCS

The C9100i super control is used for the computerized control of labelling. The Super Controller MCS consists of one terminal unit with the designation “MCS-T”, and one control unit with the designation “MCS-IO”. The terminal unit and the control unit are linked together by means of a cable. The power supply is provided by the MCS-IO which supplies the input terminal with 24 VDC via this cable. The input terminal is only used for the purpose of programming and storage of parameters. Once programmed, the MCS-IO controllers can also operate without the terminal unit. All the parameters of the controller are classified in two groups with the respective designation “Program” and “Configuration”. The program parameter group can be set by an operator (normal user). The configuration parameter group belongs to an engineering activity and has to be set by a trained user (the super user). Programs and configurations can be loaded from the MCS-IO controllers. The super control system can communicate in several languages. The desired language can be set in the “configuration” menu. Dimensional units can also be set. Length in mm or 1/16” and speed in m/min. or feet/min.

structure

The collamat detects the goods at a determined place over the paperweb (or conveyor) and start the labelling process (start of labelweb motion) after a delay time which is function of the position value and a predetermined labelling speed. The collamat is working in the *synchronized labelling mode* at low speed range; the speed measurement of the goods is done with the signal of an encoder. The synchronized mode means that the labelling speed matches the speed of the goods at the moment of dispensing. At high speed range, the collamat will switch to the *fixed dispensing mode (or asynchronous labelling mode)*; that means the labelling speed is done at a fixed value independently of the actual goods speed. This changes of labelling mode are driven with the state of the collamat input signal “ready”. All values of the position, fixed labelling speed, etc are set as parameters on the collamat; see also the operating manuals “C91monitor” & “traction unit”. In the high speed range the labelling process acts as a roughly first order delayed process; the result is a linear backward moving position of the label on the goods, which increases linearly with the goods speed.

collamat

The super controller (MCS-I/O) compensates this delay by generating an appropriate new GSC- signal which is connected to the collamat. The MCS-I/O is, therefore from an electrical point of view, placed between the goods detection systems (goods scanner or mark reader in case of formulars) and the collamat. The signal of each mark reader (GSC = goods scanning or trigger) and the encoder will be connected to the corresponding inputs fitted at the rear panel of the MCS-I/O with the respective denomination 1, 2, G; 1 = Trigger 1 for the collamat A (master), 2 = Trigger 2 for the collamat B (slave) and G = encoder for the speed measurement of the paperweb. Both trigger signals will be delayed according to

connection

a sophisticated computerized algorithmus and appear again on 4 output connectors; outputs 1 & 2 are dedicated to the collamat A (master) and outputs 3 & 4 to the collamat B (slave). Output 2 and output 4 are connected to the GSC-2 inputs of respectively collamat A and collamat B (goods scanning). The encoder signal is divided by 10 and appears as exactly the same signal (encoder-signal / 10) on the output connectors 5 & 6. Output 5 and output 6 are connected to the GSC-1 inputs of respectively collamat A and collamat B (encoder input). The cabling of the collamat does correspond to the measuring method with incremental encoder. All the wirings between super controller and C91 monitor are already done in accordance to the following wiring table.

wiring table for the super controller (MCS-I/O)

MCS I/O input	MCS I/O output	C91 monitor (I)	peripheries	internal PLC (I/O)
Trigger 1			mark reader A	
Trigger 2			mark reader B	
G (encoder)			encoder	
	channel 1			GSC-A counting (I)
	channel 2	GSC-2, A		
	channel 5	GSC-1, A		
level, S				C91-A on/off (O)
	I/O, out 1	ready, A		
	channel 3			GSC-B counting (I)
	channel 4	GSC-2, B		
	channel 6	GSC-1, B		
I/O, In1				C91-B on/off (O)
	I/O, out 2	ready, B		

configuration

As said before, the maximum backward shift of the label position is reached by the highest goods speed. This length can be measured and put in the MCS-T (terminal) as a parameter with the designation "*compensation length*"; the value of this highest goods speed does correspond to an other parameter "*vmax product*". The highest possible goods speed is determined by experiences and depends mainly from the size of the label. The best compensation accuracy is reached by setting the parameter value of "*vmax product*" just a little higher (for instance 5%) than the effective possible highest goods speed. The switching between fixed and synchronized dispensing modes on the collamat is set at the value "*vmax collamat*" which is an other configuration parameter of the controller. The super controller sets an I/O output (out 1 for Collamat A and out 2 for Collamat B) in function of the actual measured goods speed compared to the defined value for "*vmax*

collamat". This two outputs drive the ready-signals of the collamat (see wiring table above). All these mentioned parameters belong to the group "Collamat-Parameter" inside the configuration parameters of the controller; below a table of all "Collamat Parameter" with the corresponding function description.

Table of "Collamat-Parameter" on the super controller

parameter designation	function
"vmax product" *	set the maximum possible speed for the goods *
"Trigger distance"	length between mark sensor and dispensing edge
"vmax Collamat"	switching value between low speed range and high speed range
"Position Collamat"	copy of the position value, set as parameter on the collamat
Compensation length	length value to be compensated at "vmax product"
"Correction length 1:" ** "at speed v1:"	length value 1, as linearity correction for the speed value 1 (point of support)
"Correction length 2:" ** "at speed v2:"	length value 2, as linearity correction for the speed value 2 (point of support)
"Correction length 3:" ** "at speed v3:"	length value 3 as linearity correction for the speed value 3 (point of support)

* : this parameter is valid for both dispensing unit (Collamat A & B);
all other parameters exist twice and belong to a set, each dedicated to their respective dispensing unit (Collamat A and Collamat B).

** : this parameters are generally not configured

Aside the configuration set "Collamat Parameter", we have also the set "Channel parameter", the set "MCS-IO controller" and the set "MCS-T userinterface". All these 4 sets belong to the *Configuration Group* and are explained more in details below, under point "menu structure".

The program group with the designation "*Progam editor*" is composed of two sets with the respective designations, "length editor" and "clear channel". The main purpose of the "length editor" is to define the label position on the goods with respect of the formular edge; the black mark on the formular does coincide with the formular edge (beginning of a new formular). A serie of 32 labels could theoretically be programmed and placed with one black mark (GSC-Trigger). The set "clear channel" allows to reset already programmed channels. The controller has 4 channels which correspond to the 4 outputs, output 1 to output 4, described above under connection. Channel 2 and channel 4 drive GSC-2 of Collamat A respective Collamat B. Channel 1 and channel 3 are the respective copies of channel 2 and channel 4 and have to be therefore programmed absolutely identically. They are connected to the internal PLC for counting the goods crossing the respective mark reader.

Programming

Remark: output 1 & 3 are always active, also when the corresponding dispenser (collamat) does not work. In comparison output 2 and 4, drives directly the corresponding collamat over the GSC-2 signal and can for this reason only be active when the assigned dispenser works.

More details below, under point "menue structure".

memory

All parameter groups (program and configuration) could be saved and read back from a non volatile memory in the MCS-T. From there the corresponding sets could be edited and saved back under a dedicated Nr. for the programming-group and for the configuration-group. Each group Nr. could also be downloaded or read back from the MCS IO. Inside the MCS IO, only one group for respective the Program and the Configuration is stored in a non volatile memory. This actually stored pair of groups makes the system working.

The MCS IO is able to store up to 99 groups. Each pair of group Nr. could be assigned to a label type.

More details below, under point "menue structure".

Human machine interfaces

The human/machine interface is build up of an operator box for controlling the system mode (see below, under operating box) and the terminal of the super controller (MCS-T) for parameters (program and configuration) and visualisation.

Both elements are accessed from the front of the system; the operating box is fixed on a tube and the terminal is placed on a little desk fixed on the same tube under the operating box. A connector fixed on the wall side of the box does allow the connection between the two MCS units (MCS-IO & MCS-T).

operating box and Terminal unit of the super controller.



The box has an IO-Terminal with 6 buttons, a LCD display, two push buttons, three switches, an error lamp and an emergency stop button.

operating box

The operator can with the terminal, select between three system operating modes, and in case of Nonstop mode set the number of goods between the two collamats.

The three system operating modes are:

- non-stop (0),
- both collamats active (1),
- both collamats inactive (2)

The use of the operating box, including the terminal is self explaining. Aside the terminal, following buttons are assigned to functions as described below.

three switches for:

- release pneumatic (on/off)
- release collamats (on/off)
- reset for new starting procedure after failure and stop state.

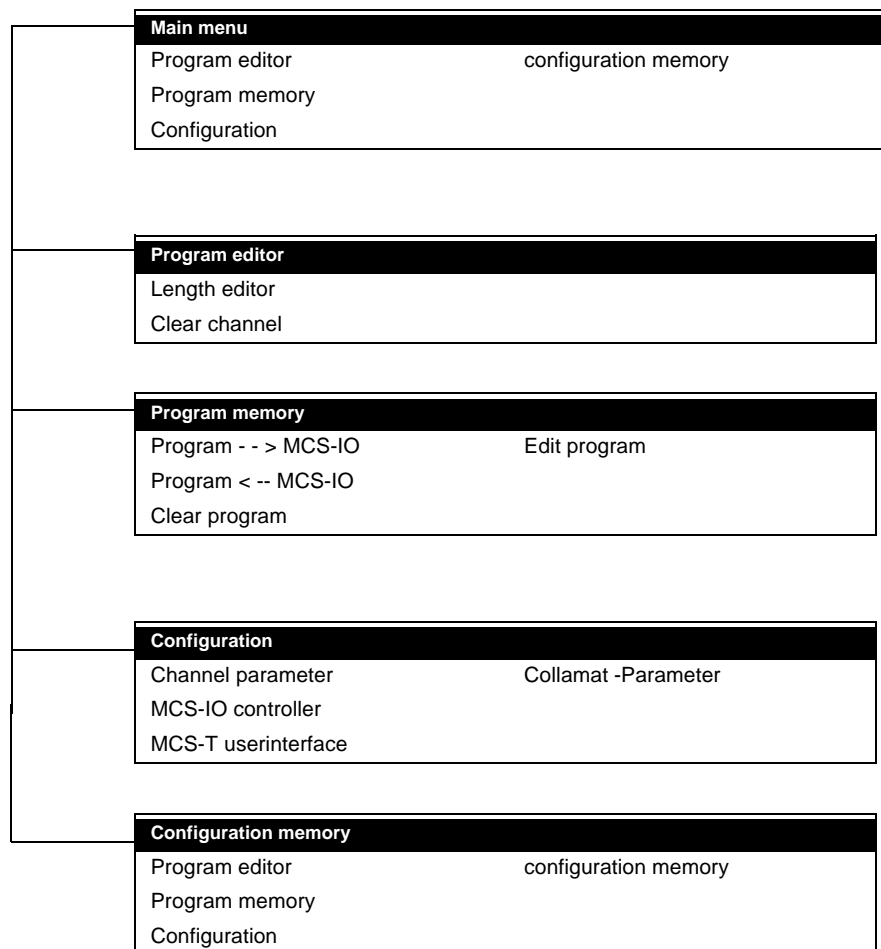
two push buttons for:

- switch on the control logic after power on.
- switch between collamats while in nonstop mode

The connector for the external removable link with the MCS-T, is internally connected (fixed wiring) with the MCS-IO.

Terminal

The terminal (MCS-T) is build up of a LCD display and a set of push buttons. The following general rules explain how the user can navigate, edit, store and recall all the necessary parameters.

Menu structure,**main (1).****program (2),****configuration (3),****Description****(1), main:**

navigation between programming and configuration modes for the purpose of parameter setting and file handling of parameter sets (call and store from/to the non volatile memory).

(2), program:

- setting placement of one or several labels (up to 32) referenced to the formular edge norml user
- setting the pulse width (in duration) at output 1 to 4.

(3), program memory:

- read, save the parameter sets (up to 99) for programming in the MCS-terminal and read/save from/to the MCS-IO.

(4), configuration:

- setting all the necessities parameters for speeds (dispensing, goods) and delay-compensations.

(3), configuration memory:

- read, save the parameter sets (up to 99) for configuration in the MCS-terminal and read/save from/to the MCS-IO.

Program editor

Program editor	
Length editor	Configuration memory
Clear channel	

Length editor	
Controller/Channel.# 1.1	[. .1] [. .2] [. .3] [. .4] [. .5]
Distance from edge:	
Pulse duration (at vmax):	

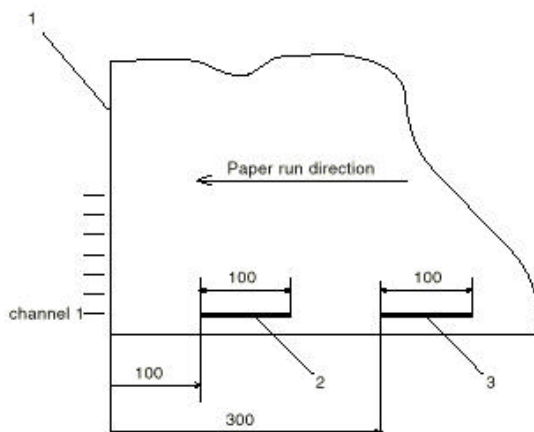
Clear Channel	
Controller/Channel.# 1.1	Clear channel

Length editor,**Clear channel,****Description****Length editor:**

- set length of position of the label from the formular edge which corresponds to the black mark. Up to 32 successive labels could be sequentially placed with reference to the formular edge.

The start of each position is related to the edge of the sheet. This enables the position of individual labels to be changed without affecting other labels.

Example of position



- The pulse duration for each output of the corresponding has to be set in time; this time does correspond to the pulse duration (time) at maximum goods speed.

Clear channel:

- select the output channel; select clear channel and press enter taste. The corresponding parameters value will be cleared.

Program memory.**memory****Clear program****edit program**

Program memory	
Program - - > MCS-IO	Edit program
Program < - - MCS IOy	
Clear program	

Clear program	
Program Nr.: # 10	
Clear program	

Edit program	
Program Nr.: # 10	
Length editor	

Description of program memory

The programming parameters of the MCS-IO can be read into and stored in the operator unit. From there, these saved parameters can be transferred back to the MCS-IO. Saved positions can be adjusted without disturbing or interrupting operation. This makes it possible to prepare the next setting during production.

The length editor does correspond to the procedure already described above under "Program editor, length editor".

Configuration

channels

controller

Configuration	
Channel parameter	Configuration memory
MCS-IO controller	
MCS-T user interface	

Channel parameter	
Controller/Channel: # 1. 1	
... 1. Trigger source:	# <i>trigger 1</i>
... 2. Vmin:	# <i>0 [m/Min]</i>
... 3. Reaction if v<vmin:	# <i>clear sequence</i>
... 4. Enable input:	# <i>off</i>

MCS-IO controller	
Controller: # 1	
... 3. Trigger source:	# <i>trigger 1</i>
... 4. Encoder pulses/1000mm:	# <i>4550</i>
... 5. Trigger 1 input:	# <i>(-) input (normal)</i>
... 6. Trigger 2 input:	# <i>(-) input (normal)</i>
... 7. Station number:	# <i>1</i>
... 8. Program version:	<i>4.4</i>

Description of configuration

Each channel is triggered by one of the two signals Trigger 1 or Trigger 2.

The signals Trigger 1 and Trigger 2 originate from the relevant external trigger input (black-mark-sensor). The triggering edge is programmable, but it is recommended that the active (connecting) edge is to be used. After triggering, the trigger is blocked until the position of the last label. This means that if you have programmed 32 labels, the trigger will be blocked all this distance.

Interrupting/cancelling the labelling

The labelling process can either be interrupted or cancelled in the event of:

- the speed falling below the minimum speed set for a particular channel
- the external enable contact (ENABLE input) being opened.
- emergency button has been pressed (In the event of a fault the alarm output will be connected until the fault is rectified.)

user interface

MCS-T user interface	
1. Station number:	# 1
2. Language:	Deutsch
3. Length unit	# [mm]

Description

All the parameters relating to the MCS-T user interface are located in the "MCS-T user interface" sub-menu.

"1. Station number.:"

Always nr.1

"2. Language:"

Choose a language of communication.

"3. Length unit:"

All lengths and speeds can be either metric or imperial. The units can be changed at any time; saved lengths remain unchanged.

collamat parameter

Collamat parameter		
Controller: # 1	# 1	
... 1. vmax product:	200 [m/Min]	
... 2. Trigger distance:	100.0 [mm]	100.0 [mm]
... 3. Vmax collamat:	80.0 [m/Min]	80.0 [m/Min]
... 4. Position collamat:	2.0 [mm]	2.0 [mm]
... 5. Compensation length:	50.0 [mm]	50.0 [mm]
... (at vmax product)		
... 6. Correction length 1:	[mm]	[mm]
... at speed v1	[m/Min]	[m/Min]
... 7. Correction length 2:	[mm]	[mm]
... at speed v2	[m/Min]	[m/Min]
... 8. Correction length 3:	[mm]	[mm]
... at speed v3	[m/Min]	[m/Min]

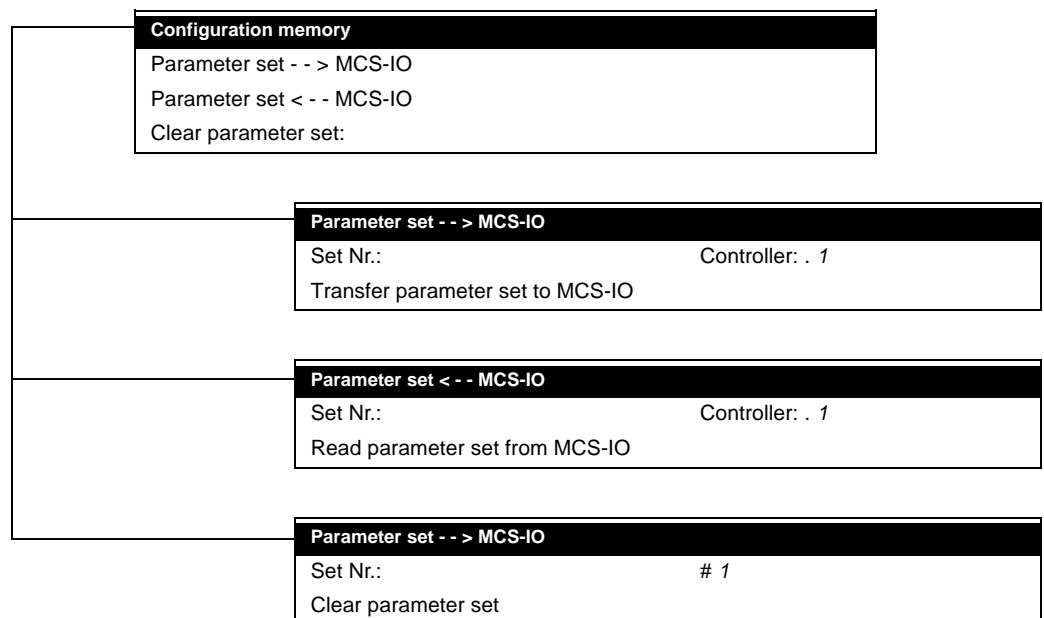
Description

All the parameters, except "1. vmax product" are assigned respectively for each collamat. The values at the left are assigned to collamat A (master) and the value on the right are assigned to collamat B (slave).

The vmax product is applied on both collamats.

- Trigger distance between dispensing edge and mark-reader
- Vmax collamat, max dispensing speed
- Position collamat is the copy of the position parameter on the corresponding collamat
- Compensation length is the corresponding delay length at vmax product that has to be compensated.
- Correction length x, is a linearity correction at corresponding speed x; normally these three correction are not to be used.

configuration, memory



Description

The configuration parameters of the MCS-IO can be read into and stored in the operator unit. From there, these saved parameters can be transferred back to the MCS-IO. Saved parameters can be adjusted without disturbing or interrupting operation. This makes it possible to prepare the next setting during production.

menu tree

Menu Tree	Userlevel	Operating mode	Explanation
Main menu			
--Program editor	Super user	On	
----Length editor	Super user	On	
----Clear channel	Super user	On	
--Manual mode	-----	-----	
--Program memory	Operator	On	
----Program --> MCS-IO	Operator	Off	Transfer program to MCS-IO
----Program<--MCS-IO	Super User	Off	Read program from MCS-IO
----Clear program	Super User	On/Off	
----Edit program	Super User	On/Off	
-----Length editor	Super User	On/Off	
-----Stich mode	Super User	On/Off	
--Configuration	Super User	On/Off	
----Channel parameter	Super User	On/Off	Display/alter the parameters of individual channels in the MCS-IO controller
----MCS-IO Controller	Super User	On/Off	Display/alter the parameters of individual MCS-IO controller
----MCS-T user interface	Super User	On/Off	Display/alter the parameters of the MCS-T user interface
----Collamat Parameter	Super User	On/Off	
--Configuration memory			
----Parameter set -->MCS-IO	Operator	On/Off	
----Parameter set <--MCS-IO	Super User	On/Off	
----Clear parameter set	Super User	On/Off	

Chapter 6: Operating Instruction

When carrying out operating instructions you have to be aware of that C9100i continues a monitor, a MCS-Terminal and an operating box. In principle, each MCS-T user interface, each MCS-IO controller and the individual channels in the MCS-IO controller must be configured. The configuration parameters are divided into the following Nonstop control with a PLC.

Introduction

Nonstop

Since the nonstop function is controlled by a PLC the Collamats have to be configured in normal-mode. That means they should NOT be configured in Master/Slave mode but configured as single dispensers in the monitor menu tree/programming/ change program/ labelling mode/ normal labelling. The PLC has both of the Collamat goods signals as input (connected to output 1 and output 3 of MCS-IO), and control the release of both the Collamats. This means that the PLC controls the entire nonstop function, counts the products in between the Collamats and the PLC controls the delay of run/stop of the relevant dispenser. When in use in an endless-forms operation the PLC must be told how many products there are between the Collamats at the start. This is done at the control box with the key GSC.Operating Instructions.

The operating instructions are classified in three groups:

General

- the **normal operating**, where the adapter and all parameter are already set. The operator or normal user starts/stops the system, feeds it with the consumable (label rolls) and removes the backing paper.
- the **initialisation**, where the operator has to adjust the adapter and set all parameters in the monitor and super controller according to already known values.
- the **optimisation**, where the super user has to define the adapter adjustment and also to define all the needed parameters in the monitor and super controller in case of a brand new label. The super user is a trained person who understands the optimisation rules described below.

- Power on sequence
 - switch on the main switch on the control box (external side wall)
 - press the "on" button on the operating box; be sure the emergency switch is set to off
 - set the "Collamat disable switch to on; right position
 - set the run/stop switch off each monitor to "run"
 - set the "vacuum enable" switch to on, right position
 - if the error-lamp is lighting, turn the reset key to the right and go back to the left.
- Select the system mode on the programming-panel (panel on the operating box)
one of three system-modes can be selected by the programming-panel;

Normal operating

"non stop", "on" (both Collamat), "off" (both Collamat)

- press key 4, press enter key, set the right number by the increment/decrement arrows-key according following rule: 0:= "non stop"; 1:= "on"; 2:= "off"

The normal mode is the "non stop" mode; the other two modes will not further be of interest.

- Set the GSC2-3 counter value
In non-stop mode it is important to declare always the amount of goods between the two Collamats working respectively as a master and a slave.
- press key 3, and select the right value with the corresponding "arrow-key"
remark: before selecting a new menu-tree with the adequate key-number, press always first key "F1", and then press the wished key.
- Release the labelling procedure
- set the "Collamat disable switch to off; left position; one of the Collamat is labelling
- changing the active Collamat is done by pressing the "Collamat Switch" button. Each time this button is pressed for a brief moment, the active labeller will be changed.

Each Collamat will automatically stop when consumable-stock are low (LLO-signal) or waste are full (Rewinder full signal). The other Collamat will automatically start at the right moment without missing a label on a goods or labelling twice a goods. The non stop procedure, the placement of the new label web and the take-off of the waste are explained in the several manuals of the Collamat 9100.

Initialisation

The operator has to initialise the system for a label that is already optimised. This means that the selection and all the adjustment-values of the adapter are already documented. All necessities parameters are saved in the appropriate program set-number and configuration.-number in respectively the monitor and the super-controller (MCS-T).

• Adapters

- select the right adapter (adapter_1 or _2 for respectively short or long labels).
- The adapter has the necessities ruler with 0.5mm resolution on it; that feature allows the operator to exactly reproduce the initial adjustments.
- adapter_1 (short label)
 - D1: distance between axe of pressure-roll to dispensing edge
- adapter_2 (long labels)
 - D1: distance between axe of pressure-roll to dispensing edge
 - D2: position of LSC-pack referenced to the holm
 - D3: distance between axe of pressure-roll to vacuum plate (normally fixed for all labels)

• Program set on the Monitor

- select the corresponding program-number with the main parameters "Predispensing, Position, Speed";

• Program set and Configuration set on the Super controller (MCS-T)

- For each label the operator has to select the corresponding No and Configuration No from the MCS-T and to down load it to the MCS IO.
- select program memory
- select Program to MCS-IO

- select the corresponding Program No.
 - transfer the program to the MCS-IO
- see also Chapter 5, "Super Controller MCS"

- Go to normal operating

Once the initialisation is done, the operator goes to the normal operating mode and start the labelling system.

adapter selection

With each new label the super user has to define the adapter (selection & adjustments) and the several parameters for the monitor and the super controller.

Optimisation,

- Adapters-selection

Selection is made in consideration of the label-length;

if the length is over 40mm select always adapter_2 (long labels);

if the length is lower than 30mm select always adapter_1 (short labels)

else both adapter could be used but the experience will guide the selection in consideration of label-shape, -stiffness and -adhesive.

adapter selection

- Adapter-adjustments, ;

- the contact between pressure-roll and paper does correspond to a line, the **contact-line**.

- **setting rule 1:**

the distance between contact-line and dispensing-edge is the **bridge-length (or D1)** and has a value equal: $\text{label-length} - 2\text{mm}$;

All length could be referenced to a standard label of 50mm length with following adjustment:

- D1 = 53 (on the D1-ruler)

Examples

- if the label has a length of 60mm, we place the adapter so we can read 43 on the ruler.

- if the label has a length of 40mm, we place the adapter so we can read 63 on the ruler.

adaper adjust-ments

- Monitor parameter (program), **rule 1**

- predisensing: set the value for a sliding contact between front label edge and pressure-roll
all other parameters are constant with followingvalue:

- position: 0mm

- speed: measuring-mode, encoder (2.20mm), max. speed 60m/Min.

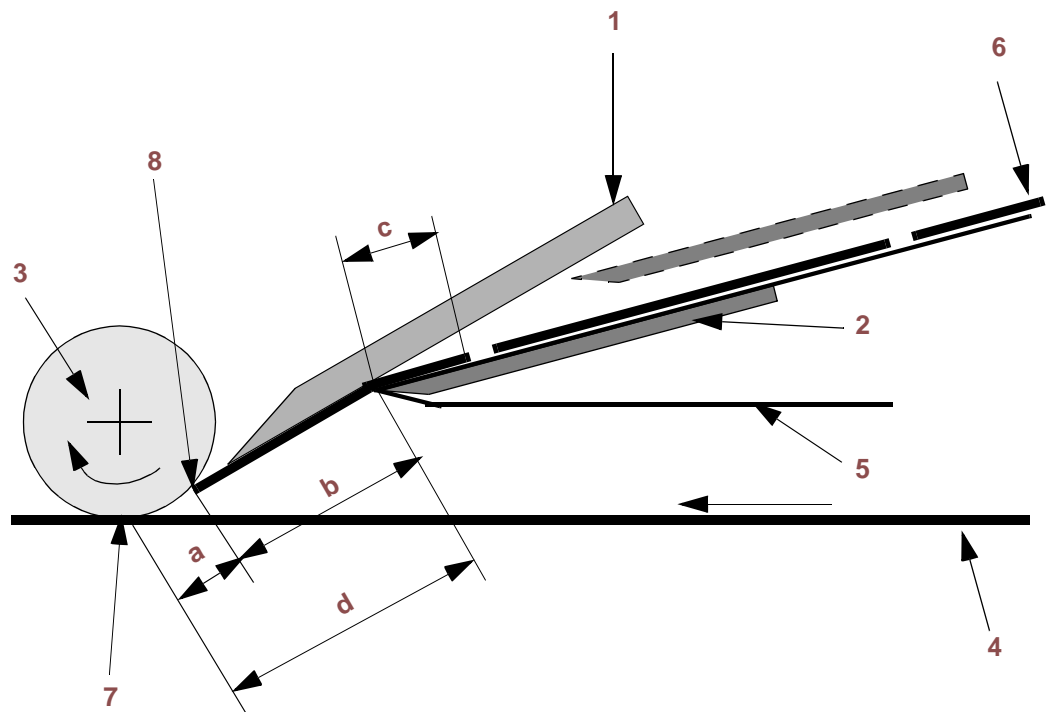
parameters

- MCS-T (program & configuration), **rule 1**
 - compensation-length: set to 0mm;
 - start labelling-process at 60m/Min goods-speed;
 - start labelling-process at maximum goods-speed, measure the delay-distance between the label-position for the two goods-speeds.
 - put this value as the new compensation-length.
- All other values remain constant

Store this parameters to a label corresponding program-number; the normal user or operator could always select them.

Label adjustment, figure

Label position on the adapter while Stop phase in dispensing mode



Definition:

1: vacuum plate; 2: dispensing edge; 3: pressroll; 4: paperweb (formularweb)
5: labelweb (backpaper); 6: label; 7: contact line 8: touch line

Mechanical adjustment rules:

$b + c = \text{label-length}$; $d := D1 = (a + b) = \{(\text{label length}) - 2\text{mm}\}$; $a := c - 2\text{mm}$

Chapter 7: Technical Data

Error handling

When a fault has occurred on the Collamats' monitor, press enter, correct the fault according to the list below and then press enter again.

Error messages Monitor Collamat

Error #	Error message	Error cause	Solution
1	Not ready	External appliance (flat printer, hot-satmp etc.) has not yet released the signal READY at the starting time of the labelling.	Reduce the cadence. Reducing time activated by the READY signal.
2	TUNIT/ Paper end	1. The lock in the traction unit is open. 2. The label roll is empty	1. Close lock of traction unit or paper brake. 2. Insert a new label roll
3	Position too short	The position value is too low for the actual labelling speed. The label is stuck in the false position on the goods.	Increasing the position value or reducing the labelling speed
4	Max. speed	The measured goods speed is higher than the entered max. labelling speed. Labelling becomes faulty.	Reducing the goods speed or, if possible, increase the max. labelling speed.
5	Label stock	The labelling stock of the unwinder is full.	Replace empty label roll.
6	Rewinder full	The rewinder disk of the rewinder is full.	Remove the label roll from the reewinder disk.
7	No LSC-Adjust	Adjustment of the label scanner not possible. The scanner is defective or it is scanned on label instead of gap, or the baking paper is not transmitted enough.	Shift gap under the label scanner and adjust it again. Possibly exchange defective scanner.
8	Nonstop-mode		Do not do anything, not applient with C9100i nonstop with PLC

Error #	Error message	Error cause	Solution
9	Label too long	<p>A leading label edge could not be scanned within the entered label length. The cause of this error can be as follows:</p> <ul style="list-style-type: none"> • Missing labels on the label web • Slippage of the traction unit or loss of stepper motor due to hits on the label web or too high frictional force. • Value of label length is entered too short • Predispensing greater than label length • Error of label scanning 	<ul style="list-style-type: none"> • Enter in general the label length two times. • Correct predispensing • Adjust suppression of label scanning • Check label scanner and possible clean it • Reduce friction force of entire label web
10	LSC Counter	When braking the label, a gap was detected during predispensing. This happens in the case of transparent or very reflective labels.	<ul style="list-style-type: none"> • Adjust of suppression of label scanner • Optimise the positioning of label scanner • Optimise the label sensitivity
11	Drive not ready	The motor drive card indicates that it is not ready to drive the stepper motor.	Switch off the motor. Wait 10 seconds before switching on again. If the error has not disappeared, the monitor is damaged and has to be repaired by a specialist.
12	Undervoltage	During labelling a mains causing the data to be backed up. The monitor continues to operate normally.	
13	Profiling speed	The max. profiling speed exceeds the max. permissible labeller speed.	Reduce the goods speed or possibly increase the max. labeller speed.
14	Time observing	An internal protective circuit has detected that the calculation time provided is exceeded or a calculation error is in processor. The cause may be a very strong electromagnetic disturbance or a program error.	Switch off and on the monitor. If the error persists, please note all monitor settings and contact your technical supporter.
15	Division by zero	-----"-----	-----"-----
16	Predispensing too short	At the actual measured speed the brake ramp exceeds predispensing	Reduce the goods-speed or increase predispensing.

The operation can only stop due to three different reasons:

- both Collamats have LLO (low label)
- or RWF (rewinder full)
- or both of the Collamats are NOK (not OK)

After a nonstop fault the system must be new started and the number of products between the Collamats must be reprogrammed at the control box with the GSC-key.

Nonstop-Error

For technical data about:

- the labeller please see Technical handbook Collamat 9100

Further information